

LS 5HB (4 units)
Biomedical Research: Essential Skills and Concepts

Instructors

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Course Description

In this class, you will be immersed in the world of biomedical research at UCLA. You will listen to two Faculty Research Seminars that will expose you to cutting-edge biomedical research conducted on campus. These seminars are one-hour lectures given by outstanding UCLA faculty on primary research projects from their own laboratories. They will introduce you to questions of general biological interest that are studied in UCLA research labs. Areas of study may range from fundamental problems in molecular biology to mechanisms of human disease.

Each seminar will be followed by a series of classes in which we will explore the science behind the research. We will discuss scientific concepts and experimental approaches used in the talk. We will learn how to analyze a seminar in terms of its central questions, experimental data, conclusions of the speaker, significance of the work and possible future directions. We will pay particular emphasis to experimental design and the importance of control experiments. After these classes, we will invite the faculty speaker back and you will have an opportunity to ask him or her questions about the research. We will also read and discuss papers from the primary literature with the same analytical goals in mind. Finally, we will learn how to use the Internet to find published literature and scientific data that can enhance our research.

By the end of this class, you will have the confidence and intellectual tools to understand biomedical research!

Class Time and Location

Lecture: Tuesdays and Thursdays, 12:30-1:45 PM
 Physics and Astronomy, Room 1434A

 Fridays, 4-5 PM
 La Kretz 100

Assignment and Grading

Class participation is important! Your grade will depend in part on how much you speak up or ask questions in class. Remember, there is no such thing as a foolish question. If you don't understand something, it is more foolish not to ask a question! And some of the most simple or apparently naïve questions end up being the most provocative. So speak up!

There will be several short assignments or problem sets of 4-6 questions based on material covered in class. They will be used to monitor your understanding and to encourage you to think creatively about the science.

Your midterm assignment will consist of a short paper of about 3 pages, in which you will summarize the problem(s) studied by the seminar speaker, the experiments and their results, and the conclusions and significance of the work. You will also suggest one or two future directions that you might want to investigate if you were doing the research.

Beginning with week 6, we will do "What's New?" student presentations. These presentations will be 10-minute summaries of a paper on any topic in biology that was published in a major scientific journal within the previous two months. You will quickly highlight the major questions, one or two key experimental results, the conclusions of the paper and why it is important. The purpose of this exercise is to get you used to reading the current scientific literature. You will choose the paper, but please clear it with me in advance, so we don't end up with two people doing the same one. You may consult with me in advance of your presentation if you have questions.

The final assignment will be a 3-5 page paper, the topic of which will be revealed later in the course. It is due Tuesday, June 12.

Your final grade will be calculated as follows:

Class participation –	200
Problem sets –	200
Midterm paper –	250
Presentation -	100
Final paper –	250
Total –	1000 points

(tentative schedule)

Week 1

Tuesday, Apr. 3 Seminar 1. Dr. Gregory Payne – Vesicle trafficking in the yeast *Saccharomyces cerevisiae*.

Thursday, Apr. 5 Overview of protein and vesicle trafficking in cells.

Friday, Apr. 6 Yeast as a model system.

Week 2

Tuesday, Apr. 10 Adaptor proteins and domains.

Thursday, Apr. 12 Synthetic genetic interactions. What do they mean?

Friday, Apr. 13 The logic of genetics and biochemistry.

Week 3

Tuesday, Apr. 17 The two-hybrid screen. Using yeast to find a partner.

Thursday, Apr. 19 Co-immunoprecipitation and other ways to see if proteins bind each other.

Friday, Apr. 20 Research paper discussion. Duncan et al., (2003).

Week 4

Tuesday, Apr. 24 ENTs and epsins. What are they good for?
Problem Set 2 due.

Thursday, Apr. 26 Chemical genetics. Get inhibited!

Friday, Apr. 27 Research paper discussion. Paper to be announced.

Week 5

Tuesday, May 1 TBA.

Thursday, May 3 **Midterm assignment 1 due.** Recap of Seminar 1.

Friday, May 4 TBA

Week 6

Tuesday, May 8 Seminar 2. Dr. Kelsey Martin. Local protein synthesis and its role in learning and memory.

Thursday, May 10 TBA

Friday, May 11 “What’s new?” student presentations.

Week 7

Tuesday, May 15 TBA

Thursday, May 17 TBA

Friday, May 18 “What’s new?” student presentations.

Week 8

Tuesday, May 22 TBA

Thursday, May 24 TBA

Friday, May 25 “What’s new?” student presentations.

Week 9

Tuesday, May 29 TBA

Thursday, May 31 TBA

Friday, June 1 “What’s new?” student presentations.

Week 10

Tuesday, June 5 Recap of Seminar 2.

Thursday, June 7 TBA

Friday, June 8 TBA

Final paper due Tuesday, June 12.